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XVIII. *On the fossil Elk of Ireland.* By THOMAS WEAVER, Esq. Member of the Royal Irish Academy, of the Royal Dublin Society, and of the Wernerian and Geological Societies.

Read May 19, 1825.

NOTWITHSTANDING the frequent occurrence of the remains of the gigantic elk in Ireland, it is remarkable that precise accounts should not have been kept of all the peculiar circumstances under which they occur entombed in its superficial strata. To obtain an opportunity of examining these relations had long been my desire ; and as fortunately, during my avocations last autumn in the north of Ireland, a discovery came to my knowledge that seemed likely to throw light on the subject, I proceeded to its investigation, intending, should the results be found deserving of attention, to place them on record. These results have proved the more interesting, as they apparently lead to the conclusion, that this magnificent animal lived in the countries in which its remains are now found, at a period of time which, in the history of the earth, can be considered only as modern.

I had advanced thus far when I became apprized of an analogous discovery made last year in the west of Ireland by the Rev. W. WRAY MAUNSELL, Archdeacon of Limerick ; which is not only confirmative of my own experience, but has the additional value of embracing particulars not hitherto noticed by any other observer. Mr. MAUNSELL's researches,

elucidated by the able assistance of Mr. JOHN HART, Member of the Royal College of Surgeons, have been communicated from time to time to the Royal Dublin Society in the form of letters, and have been entered upon their minutes ; and, it is to be hoped, that a distinct publication on the subject may hereafter appear, illustrated by a description of the splendid specimen of the skeleton of the animal now deposited by the liberality of the Reverend Archdeacon in the museum of that Society. In the mean time I propose, after giving a concise account of my own inquiries, to refer briefly to the more prominent points in Mr. MAUNSELL'S discoveries, in as far as they bear immediately on the question of the ancient or modern origin of those remains.

The spot which I examined is situated in the county of Down, about  $1\frac{1}{2}$  mile to the west of the village of Dundrum. That part of the country consists of an alternating series of beds of clay slate and fine grained greywacke, with occasional subordinate rocks, which it is needless at present to mention ; the whole distinguished by numerous small contemporaneous veins of calcareous spar and quartz, and traversed in some places by true rake veins that are metalliferous. Hills of moderate elevation, from 150 to 300 feet high, are thus composed. In a concavity between two of these hills is placed the bog of Kilmegan, forming a narrow slip, which extends about one mile in a nearly N. and S. direction. The natural hollow which it occupies appears formerly to have been a lake, which in process of time became nearly filled by the continued growth and decay of marshy plants, and the consequent formation of peat. The latter, however, from the flooded state of its surface, afforded little advantage as fuel,

until the present Marquis of DOWNSHIRE caused a level to be brought up from the eastward (part of it being a tunnel), and thus laid the bog dry. This measure was attended with a two-fold benefit to the tenantry, the provision of a valuable combustible, and the discovery of an excellent manure in the form of white marl beneath the peat. The latter extends from a few feet to twenty feet in depth; and the subjacent marl from one to three, four, and five feet in thickness. The marl when fresh dug has partly a grayish tinge, but on losing its moisture it becomes white.

In cutting down the peat to the bed of marl, the remains of the gigantic elk have frequently been met with; and invariably, as I am assured by the concurrent testimony of the tenantry, placed between the peat and the marl, or merely impressed in the latter. It is stated that at least a dozen heads with the branches, accompanied by other remains, have thus been found from time to time: but being unfortunately deemed of no value by the country people, they have for the most part been scattered and destroyed. It is to be hoped, however, that a sufficient inducement will lead them to bestow greater care on the preservation of whatever remains may be hereafter discovered.

The marl, upon examination, appears in a great measure composed of an earthy calcareous base, containing comminuted portions of shells; and that these are all derived from fresh water species, is proved by the myriads of these shells that remain in the marl, still preserving their perfect forms. They are however bleached, very brittle, and retain little of their animal matter; but in all other respects they have the characters of recent shells. After examining several

masses of the marl, I found the whole of the shells referable to three species, two univalves, and one bivalve: namely,

1. The *helix putris* of LINNÆUS. See DONOVAN's British Shells, Pl. 168, fig. 1, and LISTER, Conch. Tab. 123, fig. 23. N. B. Of the two, LISTER's figure is the more exact representation of the shell.
2. The *turbo fontinalis*. DONOVAN, Pl. 102.
3. The *tellina cornea*. DONOVAN, Pl. 96.

Of these shells some prevail more in one spot than in another; but generally speaking they appear distributed through the upper portion of the marl in nearly equal quantities; in the lower portion they are less frequent, if not altogether absent.

The circumstances which I have related seem to remove all idea of these remains of the Irish elk being of any other than comparatively recent origin. In seeking a cause for the nearly constant distribution of these remains in Ireland in swampy spots, may we not conjecture that this animal often sought the waters and the marshy land as a place of refuge from its enemies, and thus not unfrequently found a grave where it had looked for protection?

The foregoing conjecture appears supported by the following details of circumstances, observed by the Rev. Mr. MAUNSELL in the peat bog of Rathcannon, situated about four miles to the west of the town of Bruff, in the county of Limerick. This bog covers a space of about twenty plantation acres, occupying a small valley, surrounded on every side by a ridge of the carboniferous or mountain limestone, except on the S. W., where it opens into an extensive flat.

The peat is from one to two feet thick ; and beneath this is a bed of white shell marl, varying from  $1\frac{1}{2}$  to  $2\frac{1}{2}$  feet in thickness, succeeded below by bluish clay marl, of an unascertained depth, but in one place it was found to exceed 12 feet. This bluish clay marl becomes white, and falls to powder on being dried. Coarse gravel is said to occur, partially at least, below the marl.

In this small valley portions of the skeletons of eight individuals were found, seven of adult, and one of a young animal, all belonging to the gigantic elk. With these also occurred the pelvis of an adult animal, probably referable to the red deer ; and the skull of a dog, of the size of that of an ordinary water spaniel.

The bones that were first discovered were found at the depth of two or three feet below the surface ; and Mr. MAUNSELL had the advantage of seeing them before they were displaced. Most of the above mentioned remains were lodged in the shell marl ; many of them, however, appeared to rest on the clay marl, and to be merely covered by the shell marl. But parts of some of the bones were immersed in the peat also : these were tinged of a blackish colour, and were so extremely soft in consequence of the moisture they had imbibed, that it was with difficulty the horns found in this situation could be preserved entire ; yet, when carefully handled and allowed to dry, they became as firm and hard as the rest.

Some of the bones of the elk showed marks of having been diseased ; and one rib had evidently been broken, and afterwards reunited. Another rib exhibited a remarkable perforation of an oval form, about half an inch long, and

one-eighth of an inch broad, the longer axis being parallel to the side of the rib ; the margin of this opening was depressed on the outer, and raised on the inner surface ; while a bony point projected from the upper edge of the rib, which deviated from its natural line of direction to an extent equal to the length of the aperture. The only cause that could have produced this perforation is a wound by a sharp instrument, which did not penetrate deep enough to prove fatal, and between which event and the death of the animal a year at least must have elapsed, as the edges of the opening are quite smooth.

The bones are so well preserved, that in the cavity of one shank bone which was broken, marrow was found, having all the appearance of fresh rendered suet, and which blazed on the application of a lighted taper. They appear to contain all the principles to be found in fresh bones, with perhaps the addition of some carbonate of lime, imbibed with the moisture of the soft marl in which they had lain.

The remains of the eight individuals were disposed in such a manner as to prevent the possibility of referring the component parts exactly to each skeleton ; but all the heads with their branches were found ; and one specimen is particularly fine, displaying the broad expanded palms, with almost every antler and projecting point in a perfect state. By joining this head to a selection from the other remains, a nearly perfect skeleton of the largest size has been formed by Mr. HART ; one rib, a few of the carpal and tarsal bones, and the bones of the tail being only wanting.

Of the shells found in the white marl many are preserved entire ; but the greater part are broken into small fragments.

They are all univalves, and belong to fresh water species, which exist at the present day.

It is added, that so frequently have the remains of the fossil elk been discovered in the county of Limerick, that one gentleman enumerated thirty heads which had been dug up at different times within the space of the last twenty years.

From PROFESSOR HENSLOW'S account of the curraghs, or peat bogs of the Isle of Man, it would appear that the remains of the gigantic elk are there also distributed in a manner analogous to that in which they are found in Ireland. That gentleman supposes a herd of elks to have perished there; and his description of the white, or grayish marl, in which their remains are found, answers in most respects to that of the white marl which so frequently forms the sub-stratum of the peat bogs in Ireland.

Upon the whole, the preceding details appear to justify the conclusion, that the extinction of the gigantic species of elk is attributable rather to the continued persecution it endured from its enemies, accelerated perhaps by incidental natural local causes, than to a general catastrophe which overwhelmed the surface of the globe. In a word, it may be inferred that these remains are not of diluvian, but of post diluvian origin.

T. WEAVER.

*Kenmare, April 12, 1825.*